Alliance for Telecommunications
Industry Solutions

*Sponsor of*

Industry Numbering
Committee

A forum of the Carrier Liaison Committee

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July 9, 1997

Mr. William F. Caton
Secretary
Federal Communications Commission
2000 L Street, NW
Washington, DC 20554



Dear Mr. Caton:

In Paragraph 198 of the Federal Communications Commission's ("FCC" or "Commission") First Report and Order and Further Notice of Proposed Rulemaking, in the Matter of Telephone Number Portability, CC Docket No. 95-116/RM 8538 (FCC 96-286) adopted: June 27, 1996; Released: July 2, 1996, the FCC directed the Alliance for Telecommunications Industry Solutions, ("ATIS") - sponsored Industry Numbering Committee ("INC") to examine the issue of the technical feasibility of modifying the existing toll free database to make only those 500 and 900 numbers that are assigned to local exchange carriers portable and file a report with the FCC within twelve mnths of the effective date of the Order. The INC accepted this directive and accordingly files an original and nine (9) copies of the INC report.

If you have any questions, please feel free to call Jo Gallagher, the INC Moderator, at 703-974-8160, Paula Jordan, the INC Assistant Moderator, at 510-279-6316, or Susan M. Miller, ATIS Vice President and General Counsel at 202-434-8828.

Sincerely,

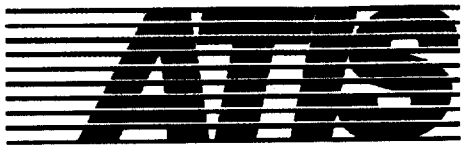
Jo Gallagher/smm
Jo Gallagher
INC Moderator

Paula Jordan/smm
Paula Jordan
INC Assistant Moderator

cc: Regina Keeney, Common Carrier Bureau Chief

No. of Copies rec'd 0+8

INC97-0606-018
Issued June 1997



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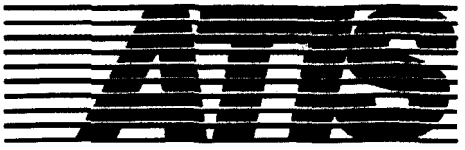

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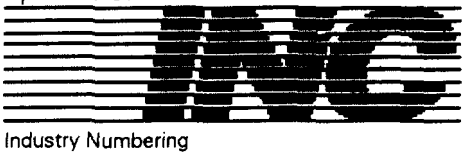

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**Report In Response to the Federal Communications Commission's First Report and Order and Further Notice of Proposed Rulemaking, In the Matter of Telephone Number Portability, CC Docket No. 95-116/RM 8535 (FCC 96-286) Adopted: June 27, 1996, Released: July 2, 1996**

## EXECUTIVE SUMMARY

In paragraph 198 of its First Report And Order And Further Notice Of Proposed Rulemaking, (hereinafter the "First Report and Order") (In the Matter of Telephone Number Portability, CC Docket No. 95-116/RM 8538 (FCC 96-286) Adopted: June 27, 1996; Released: July 2, 1996), the Federal Communications Commission ("FCC" or "Commission") directed the Industry Numbering Committee ("INC") to examine the issue of "the technical feasibility of modifying the existing toll free database to make only those 500 and 900 numbers that are assigned to local exchange carrier portable and file a report with the FCC within twelve months of the effective date of [the] order..." The Commission further asked that this examination consider whether the technical feasibility could be achieved through modifying the existing toll free database or through another system. The INC accepted this directive and accordingly, submits the following report.

In addition, INC sought the expertise of the Network Interconnection/Interoperability Forum's ("NIIF") Network's Interconnection/Architecture Committee ("NIAC") on those aspects of this report pertaining to interconnection and architecture. Thus, the consensus reflected in this report is that of the INC's and where pertaining to architectures, the NIIF's NIAC (hereinafter the "NIIF") as well. The NIIF is also sponsored by the Alliance for Telecommunications Industry Solutions ("ATIS").

The INC has interpreted the FCC's directive associated with portability for local exchange carrier ("LEC") 500 and 900 numbers to mean that only 500 and 900 numbers assigned to LECs need be portable, and that such numbers would be portable only between LECs in the United States. [1] Accordingly, 500 or 900 numbers assigned to non-LECs (e.g. interexchange carriers or CMRS ("Commerical Mobile Radio Service") providers) would not be portable and subscribers assigned these numbers, who choose to change service providers, would require a number change. Similarly, a subscriber assigned a LEC 500 or 900 number who choose to migrate their service to a non-LEC service provider would also require a number change.

In this report, the network architecture(s) that could be used to support portability of LEC 500/900 numbers are described. In addition, the report examines the impact of portability for LEC 500 and 900 numbers on number administration, resource utilization,

[1] Any reference to LEC(s) in this document refers only to FCC-regulated LECs.

network elements, and end users. Within number administration, the areas of assignment guidelines, the pooling of numbers and relief planning are also considered.

The INC and NIIF submits that the network architecture and call processing flows described in the previously developed INC Report on PCS N00 Portability could be used to support LEC 500/900 portability[2]. It is estimated that the development and deployment of this architecture could take up to forty-eight months following FCC direction.

The use of the infrastructure currently in place to support portability of 800 numbers – modified and/or expanded as necessary – for use as the vehicle for the implementation of 500 and/or 900 portability is also examined. The 800 Service Management Team – the industry organization responsible for the design and maintenance of the 800 Service Management System ("SMS")–indicates that the necessary effort for a 500/900 SMS based on the 800 SMS would take from 1.5 to 2 years from the date of firm, fully defined requirements for the SMS and appropriate client authorization and tariff approvals. The SMS portion of the development represents only a part of the necessary effort; further development of network switches and routing data bases would be required to interface with a 500/900 SMS required within the four year period.

It is concluded that the capabilities necessary for the support of LEC 500 and 900 portability are not currently available, but that the technology to provide such portability is understood and could be developed with the associated effort and expense. However, and most importantly, the INC and the NIIF concluded that portability of only LEC 500 and 900 numbers would be confusing to end users, could favor one industry segment over another, would not promote the most efficient utilization of the resources, and would be complex, time consuming and expensive to implement. Consequently, it is the unanimous opinion of the INC and the NIIF that number portability for LEC-only 500 and 900 assigned numbers should not be implemented because it is not prudent; nor is it technically feasible using existing network and administrative data base capabilities.

[2] INC Report on PCS N00 Portability, INC 95-0512-010, see Attachment 1.

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**1.0 INTRODUCTION** - In paragraph 198 of its First Report And Order And Further Notice Of Proposed Rulemaking, (hereinafter the "First Report and Order") (In the Matter of Telephone Number Portability, CC Docket No. 95-116/RM 8538 (FCC 96-286) Adopted: June 27, 1996; Released: July 2, 1996), the Federal Communications Commission ("FCC" or "Commission") directed the Industry Numbering Committee ("INC") to examine the issue of "the technical feasibility of modifying the existing toll free database to make only those 500 and 900 numbers that are assigned to local exchange carriers portable and file a report with the FCC within twelve months of the effective date of [the] order ..." The Commission further asked that this examination consider whether the technical feasibility could be achieved through modifying the existing toll free database or through another system. The INC accepted this directive and accordingly, submits the following report.

In addition, INC sought the expertise of the Network Interconnection/Interoperability Forum's ("NIIF") Network's Interconnection/Architecture Committee ("NIAC") on those aspects of this report pertaining to interconnection and architecture. Thus, the consensus reflected in this report is that of the INC's and where pertaining to architectures, the NIIF's NIAC (hereinafter the "NIIF") as well. The NIIF is also sponsored by the Alliance for Telecommunications Industry Solutions ("ATIS").

**2.0 BACKGROUND ABOUT THE INDUSTRY NUMBERING COMMITTEE-** The INC was formed in October, 1993 to provide an open forum to address and resolve industry-wide issues associated with the planning, administration, allocation, assignment and use of numbering resources and related dialing considerations for public telecommunications within the North American Numbering Plan ("NANP") area. The INC reports to the Carrier Liaison Committee of ATIS. INC participation typically includes LECs, interexchange carriers ("IXCs"), competitive local exchange carriers, manufacturers, cellular companies and paging carriers from the US and its territories, Canada and the Caribbean.

INC reaches resolution by consensus. Any interested party may submit an issue to INC. However, only issues conforming to the mission of INC will be accepted and discussed. Once consensus on an issue before INC is reached, the issue is placed in a status called "initial closure." Initial closure serves as official notification to the industry that the INC has completed its work. Notice is sent to all INC participants as well as any interested party on the INC mailing list. It is also posted to the INC website (www.atis.org/atis/clc/inc/inchom.htm). Should any party have concerns about the

proposed resolution of an issue, the party can submit contributions to INC during the interval between initial closure and final closure. The INC will consider all such contributions. After such consideration, the INC will modify the proposed resolution if consensus is reached to do so based on the contribution. The issue will then move into final closure. Final closure serves as official notification that consensus has been reached for resolution of an issue.

In this four and a half years of existence, INC has accepted over 100 issues. It has produced a number of guidelines and recommendations in use by the telecommunications industry today. These consensus documents were developed based on industry input to address the need for a uniform, consistent manner in the assignment and use of numbering resources.

**3.0 ASSUMPTIONS AND THE RAMIFICATIONS OF THOSE ASSUMPTIONS** - The INC reviewed the FCC direction in CC Docket 95-116, paragraphs 188 through 198. In order to develop the INC's response, it agreed to the following assumptions and limitations based on the information in the FCC directive. These assumptions and recognized limitations allowed the INC and NIIF participants to start their deliberations, analysis and develop understandings on common ground. It should be noted that if INC's and NIIF's assumptions are correct, then significant problems/issues are raised because it results in the concept of "limited portability" (i.e., LEC-only portability).

1) Only FCC-regulated LECs are obligated to offer number portability for their own 500 and 900 numbers to the extent technically feasible.

2) The Telecommunications Act of 1996 (hereinafter the "Act") defines the term "local exchange carrier" as any person that is engaged in the provision of telephone exchange service or exchange access.

3) Commercial Mobile Radio Service ("CMRS") providers are excluded from the definition of local exchange carriers, and therefore are also excluded from the Act's Section 251(b) obligations to provide number portability, unless the Commission ultimately concludes that they should be included in the definition of a LEC.

4) The First Report and Order does not specifically address whether 500 and 900 numbers assigned to CMRS providers shall be portable. Since CMRS providers are not by definition considered to be LECs, it is assumed for the purposes of this report that the 500 and 900 numbers assigned to CMRS providers do not have to be portable.

5) It is assumed that the offering of 500 and 900 services by LECs will increase in the future. Thus, it is also assumed that the volume of such numbers will increase in the future.

6) If it is technically feasible for only LEC-assigned 500 and 900 numbers to be portable, these numbers will be portable only between LECs and not between LECs and other 500 and 900 service providers (IXCs, CMRS, etc.).

7) It is assumed that the type of 500 and 900 service provider (LEC, IXC, CMRS) is determined by its specific business intent, and not by the principal business of the number assignee's corporate affiliation. For example, a 500 or 900 number assigned to BellSouth Wireless is considered to be a CMRS number rather than a LEC number and as such, BellSouth Wireless would not have to make its 500/900 numbers portable.

8) In the current non-portable environment for both 500 and 900 services, number assignment is NXX based; that is, numbers are assigned to 500 and 900 service providers on a NXX basis – in blocks of 10,000 numbers – consistent with industry assignment guidelines.[3] With the implementation of portability, number assignment could continue to be NXX based as it is today. However, it may be advantageous to consider number pooling, in which numbers within designated portable NXXs are made available to all 500 and 900 service providers who participate in 500 and 900 portability. If pooling is mandated by the FCC, then new number assignment guidelines for the pooled environment will need to be developed. The concept of pooling and its relationship to portability are further explained in Section 3.1.

9) 500 and 900 resources are non-geographic by nature and therefore are inherently location portable. Limitations in LECs' ability to offer 500/900 services in a given area are a function of the service area and not a function of the 500/900 service (e.g., if an east coast LEC 500/900 customer wishes to change his/her service provider to a west coast LEC, he/she can do so without a number change).

10) 500/900 portability should not have an adverse effect on existing 500/900 services or other services that could potentially be impacted by portability such as 800 services.

While the INC and NIIF agreed to develop its response on the above-stated assumptions, this report does not represent an endorsement of any of the approaches discussed herein. INC and NIIF recognize and express the concern that all scenarios related to Assumption 6, as stated above create an "unlevel playing field" between 500/900 service providers. The related assumptions, listed below, were also discussed. However, they were not considered further in this report because INC agreed that these assumptions could result in even more customer confusion and be even more problematic from a number administration perspective.

[3] See 900 NXX Code Assignment Guidelines, INC 97-0404-012, at Attachment 2 and Personal Communications Service N00 NXX Code Assignment Guidelines, INC 95-0407-009, at Attachment 3.

- Alternatively, it can be assumed that 500/900 NXXs originally assigned to LECs, and therefore portable, will continue to be portable regardless of the service provider (LEC or non-LEC) which provides service for a given line number within the portable NXX.

- As yet another alternative, only LEC-assigned numbers would be portable to LECs and non-LECs. Once ported to a non-LEC, the number would be non-portable.

The above-stated ten assumptions result in the following impacts and ramifications:

1) Some NXXs will be portable, other NXXs will not . All line numbers within portable NXXs will be portable only between LECs. Therefore, customers within a portable NXX that want to change their service provider to a non-LEC service provider will have to change their 500/900 numbers.

2) Customers within a non-portable NXX that want to change their service provider to a LEC service provider will have to change their 500/900 numbers.

3) Two sets of 500/900 assignment guidelines/administrative processes will be required; one set for portable NXXs and the other set for non-portable NXXs.

**4.0 IMPACTS OF LEC-ONLY 500/900 NUMBER PORTABILITY** - Traditionally, the concept of number portability, when introduced for a given numbering resource, has been understood to include the resource in its entirety. In its present decision related to portability for 500 and 900 services, the FCC has implied that portability for these resources be implemented for LEC-only 500 and 900 numbers; a subset of the resource. Accordingly, INC and NIIF submit that the impacts of this "limited" portability should be more fully understood.

These impacts will negatively affect number administration, resource utilization, some network elements and ultimately, end users.

**4.1 IMPACTS ON NUMBER ADMINISTRATION** - From INC's perspective, number administration is generally considered to include number assignment and number management, including the oversight of number relief.

**4.1.1 Number Pooling** - For the purposes of discussion within this report, INC has defined number pooling as all numbers within the designated portable codes (NXXs) being made available to all service providers who participate in portability. In other words, number pooling is defined as similar to existing 800 number portability. However, number pooling is not a requirement for portability. Rather, assignment in a portable environment can continue on an NXX basis with each provider assigning numbers to its potential subscribers only from those codes (NXXs) it has been allocated.

INC maintains that pooling, however, promotes number conservation and is, therefore, advantageous. Specifically, the pool of numbers, overseen by an administrator, need only be large enough to accommodate the collective needs of all providers, and need only be augmented when required by industry demand. The total number of codes assigned should be fewer than if NXX assignments were made, and the resource should last for a longer period of time. For these reasons, pooling of 500/900 numbers maybe considered if portability for 500 and 900 numbers is mandated.

**4.1.2 Proposed Assignment Guidelines For Portability-** INC submits that portability of a numbering resource requires that administrative/assignment guidelines be developed to accommodate the portability environment; specifically, the assignment practices associated with the "pool" of portable numbers, if such a pooling arrangement is adopted, and the methods and procedures required for the "porting" of numbers between service providers. INC maintains that guidelines are required regardless of whether the entire numbering resource is made portable or a subset of the resource is identified as portable.

In addition, the INC submits that the segmentation of a given numbering resource to allow some numbers to be portable and others non-portable requires that administrative/assignment guidelines be maintained for non-portable (i.e., NXX assigned) numbers, as well as for portable numbers. There currently exist assignment guidelines for PCS N00 (500) and 900 NXX assignments.[4] Accordingly, INC submits that two sets of portability assignment guidelines must be developed, maintained and used. An administrative data base for LEC-only portable numbers will need to be designed, developed, built and funded. Additionally, an appropriate administrator will need to be selected.

**4.1.3 Sizing of the Initial Pool of Portable Numbers** - Portability for LEC-assigned numbers may include the use of number pooling. The size of such a pool of numbers necessary to satisfy the needs of limited (i.e., LEC-only) portability may initially be small (i.e., the volume of 500 and 900 numbers currently assigned to LECs is small). However, INC believes that consideration must be given to accommodating the marketing needs of the impacted service providers; particularly the need to increase the size of the pool to provide sufficient numbers to afford adequate customer choice of numbers (e.g., the need to satisfy a request for vanity numbers). INC further submits that increasing the size of this pool may be problematic.

**4.1.4 Relief Planning and Pool Expansion** - If number pooling for 500/900 numbers is adopted, INC submits that the administrator must monitor the assignment of the (500 or 900) number resource to determine the associated fill rate and monitor/estimate the time at which the resource is likely to exhaust. The current NXX assignment process makes the assessment of potential exhaust straightforward. With the implementation of portability within a subset of the resource, the administrator will

[4] See 900 NXX Assignment Guidelines, INC 97-0404-012, at Attachment 2 and Personal Communications Service N00 NXX Code Assignment Guidelines, INC 95-0407-009, at Attachment 3.

also need to assess the utilization within the pool of portable numbers, the estimated growth rate, and the impact of this growth on the projected date of exhaust. It is INC's view that planning within this environment will be more complex and administratively burdensome than planning for relief, if either there were no portability, or if all numbers within the resource were portable.

INC submits that number portability with pooling provides the promise of increased utilization of the pooled resource relative to the utilization achieved with the assignment of blocks of numbers (e.g., 10,000 numbers) to a given service provider. Clearly, with portability constrained to only a portion of the resource, the potential for increased utilization is limited.

**4.3 IMPACTS ON THE NETWORK** - The implementation of "limited portability" (i.e., for 500/900 numbers) could also impact the necessary network capabilities that must be provided for call processing. Current arrangements identify a 500 or 900 call using an initial 3-digit analysis, either switch-based or through the use of an Intelligent Network (IN) or Advanced Intelligent Network (AIN) based 3-digit trigger. Identification of the call as either 500 or 900 demands examination of the following three digits (NXX) to identify the associated carrier as required for call routing. In an environment with "limited" portability, six digit analysis will be required to identify those NXXs which are portable and require further (10 digit) look-up to identify the service provider associated with the dialed number. Specifically, INC and NIIF submit that the most significant change would be the implementation of new 6-digit analysis/trigger capabilities within IN and AIN based platforms. Currently, there is a wide variation in the deployment of IN and AIN among service providers. Access providers without the required capabilities would either have to upgrade their facilities (e.g. SS7 capabilities, AIN, etc.) or route 500 and 900 traffic to other carriers for the necessary call processing.

**4.4 IMPACT ON SUBSCRIBERS** - An environment of "limited portability" will impose potentially confusing situations upon subscribers. The INC and NIIF note that subscribers will have to become familiar with the idea that some 500 or 900 numbers can be retained if they choose to change service providers, while other numbers, upon a service provider transfer, require a number change. Specifically, end users need education to understand that only LEC-assigned numbers are portable, and that the ability to retain a 500 number depends upon whether a 500 number was originally a LEC-assigned number and whether the end user seeks to port that number to another LEC 500 service provider. The INC and NIIF maintain that such end user confusion could have a broad and negative effect on subscription and use of 500/900 services.

In addition, a customer may become confused, if not irritated, upon learning that a new service the customer wishes to activate could be offered by any of a number of service providers if a given number is chosen, but can only be supplied by a single carrier if some other number is the customer's choice. For example, a customer wishes to obtain a new personal number (500) service and seeks the use of one of several possible vanity numbers. With "limited portability," a customer choosing a given

number may obtain service from several service providers, while with another number, the customer would be limited to a single provider.

Furthermore, INC and NIIF submit that the limited porting of numbers will create situations which benefit one industry segment relative to another and, therefore, provide certain competitive advantages. For example, customers with the opportunity to select one service provider versus another could choose the provider whose numbers are portable (i.e., the LEC), affording that customer the flexibility to change providers at some future date, and still keep the same number. Thus, existing LEC 500/900 number subscribers will be the only ones with the ability to retain their number to take advantage of pricing and service differences among LEC service providers. In addition, existing 500/900 number subscribers of non-LEC companies may be reluctant to change their 500/900 service provider because such a transfer would require a number change.

## 5.0 500 TECHNICAL FEASIBILITY

**5.1 500 ARCHITECTURAL/CALL FLOW ASSUMPTIONS** - The PCS N00 target architecture in the INC Report on PCS N00 Portability (INC 95-0512-010 at Attachment 1) serves as the baseline architecture for our analysis. ***It should be noted that this document assumed portability for all 500 numbers where a query is performed for every call origination to a 500 number to determine how to route the call.*** This document recommends modifications to the target PCS N00 architecture in the INC report (please refer to the INC report on PCS N00 Portability - Section 8.0 at Attachment 1 herein for details on the PCS N00 target architecture).

This target architecture could support LEC-assigned 500 numbers being portable only among LEC 500 service providers. This architecture requires a nationwide PCS administrative data base because numbers could be portable nationwide. Having such a data base would be impractical for LEC-only 500 portability, since LEC-only numbers account for such a small quantity of the total resource.

The target PCS N00 architecture call routing descriptions are applicable, with modifications, for LEC-only 500 portability. Modifications are required to determine when to launch a query to the PCS numbering data base. In the worst case, a query is performed for every call origination to a 500 number to determine how to route the call.

Given that LEC-assigned 500 numbers can be identified by the NXX blocks, INC and the NIIF submits that selective querying may be performed. When a switch receives a call origination request for a 500 number, the switch would check to see if the number is a LEC-assigned 500 number. The switch would then determine whether the called party number is within one of the 500-NXX blocks allocated to LECs. If it is not a LEC-assigned number, the switch can route the call using current call routing procedures (i.e., route the call using the NXX to determine the service provider of that 500 number). If the call origination request is for a LEC-assigned 500 number, the switch

will then launch a query to the PCS numbering data base. The PCS numbering data base will respond with one of the following:

- CIC (Carrier Identification Code)
- CIC and geographic number
- Geographic number
- SS7 point code
- "USE PIC" (Presubscribed InterLATA Carrier) message and geographic number

The switch will use the information provided in the query response to proceed with call routing. This two-step query process could have adverse impacts on call set-up times (please refer to the target PCS N00 architecture in the INC Report on PCS N00 Portability - Section 8.0 at Attachment 1 for more call routing details).

**5.2 USE OF EXISTING TOLL FREE DATA BASE** - Various approaches for the use of the toll-free Service Management System ("SMS/800") have been considered for LEC-only 500 and 900 portability. Comments below are stated in terms of LEC-only 500 portability, but apply to LEC-only 900 portability as well. The approaches considered include:

- enhancements to the existing software to partition the toll free SMS to support 500 (and 900) services;
- re-using the existing software with enhancements changes as necessary to support the relevant subset of the 500 Service Access Code (SAC); and
- software re-use/enhancements combined with the flexibility of client/server technology.

Regardless of the approach selected, the use of SMS/800 would have significant impacts. All functional areas within the system would be impacted because they would either need to be modified to support specific 500 functions, bypassed because they would not be needed for 500 or replaced with new functionality to support 500.

It is estimated that a production-grade system could be available approximately 1.5 to 2 years following completion of requirements development, architecture design , etc. and industry authorization of work and tariff approvals. There are major open issues related to the functions and interfaces of a national system for LEC-only 500 portability, including the critical areas of network management and service maintenance. Also, a choice among the three approaches described above would be needed. In order to get to the point where work could be authorized, these outstanding architectural and technical issues would have to be resolved.

## 6.0 900 TECHNICAL FEASIBILITY

**6.1 900 ARCHITECTURAL/CALL FLOW ASSUMPTIONS** - A data base architecture serves as the baseline architecture for our analysis. ***A data base***

***architecture assumes and requires a national SMS, despite the fact that a national SMS for this small quantity of LEC-only 900 numbers would be neither cost effective nor practical.***

INC maintains that a data base architecture could support LEC-assigned 900 numbers being portable only among LECs, with the obvious distinction that 900-only supports calling-party-pays services. Such a distinction could potentially require that different and/or additional data elements be returned on a data base query and would require design, development and funding of a new data base or, at a minimum, new data elements and /or modifications of the existing Signaling System 7 (SS7) protocol.

In addition, the INC and the NIIF maintains that there will be a need to determine when to launch a 900 query to the data base and to define the query response information. The document, "Technical Interconnection Arrangements for 500-Like Non-Geographic Services", ICCF96-0913-015 (Attachment 4) could serve as a baseline for consideration of potential additional data elements required for LEC-only 900 number portability.

In the worst case, the INC and the NIIF submits that a query needs to be performed for every call origination to a 900 number to determine how to route the call. Given that LEC-assigned 900 numbers can be identified by the NXX blocks, selective querying may be performed. When a switch receives a call origination request for a 900 number, the switch would check to see if the number is a LEC-assigned 900 number. The switch would then determine whether the called party number is within one of the 900-NXX blocks allocated to LECs. If it is not a LEC-assigned number, the switch can route the call using current call routing procedures (i.e., route the call using the NXX to determine the service provider of that 900 number). If the call origination request is for a LEC-assigned 900 number, the switch will then launch a query to the routing data base. The switch will use the information provided in the query response to proceed with call set-up.

**6.2 USE OF EXISTING TOLL FREE DATA BASE** - Various approaches have been considered for LEC-only 500 and 900 portability based on the use of the toll-free SMS/800. Comments below are stated in terms of LEC-only 900 portability, but apply to LEC-only 500 portability as well. The approaches considered include:

- enhancements to the existing software to partition the SMS to support 900 (and 500) services;
- re-using the existing software with enhancements/changes as necessary to support the relevant subset of the 900 Service Access Code (SAC); and
- software re-use/enhancements combined with the flexibility of client/server technology.

Regardless of the approach selected, the use of SMS/800 would have significant impacts. All functional areas within the system would be impacted because they would

either need to be modified to support specific 900 functions, bypassed because they would not be needed for 900 or replaced with new functionality to support 900.

It is estimated that a production-grade system could be available approximately 1.5 to 2 years following completion of requirements development, architecture design , etc. and industry authorization of work. There are major open issues related to the functions and interfaces of a national system for LEC-only 900 portability, including the critical areas of network management and service maintenance. Also, a choice among the three approaches described above would be needed. In order to get to the point where work could be authorized, these outstanding architectural and technical issues would have to be resolved.

## 7.0 IMPLEMENTATION

**7.1 500 IMPLEMENTATION** - The INC and the NIIF submit that if implementation of portability for LEC-only 500 numbers is mandated, such implementation should be performed consistent with this document and the INC Report on PCS N00 Portability (INC 95-0512-010) at Attachment 1. The INC PCS N00 Portability Report provides detailed information on the network infrastructures necessary to support portability for PCS N00 type services. The analysis provided within the INC PCS N00 Portability Report applies primarily to the 500 numbers since the PCS N00 architecture is referenced. It should be noted that the INC PCS N00 Report identified several questions which need to be addressed before LEC-only 500 number portability implementation could move forward (see specifically Section 9.1, page 28 of the INC Report on PCS N00 Portability). Without FCC direction on these questions, LEC-only 500/900 portability could not move forward. Even if FCC direction were received, the INC and the NIIF emphasize that deployment of the necessary network infrastructure could not be implemented in the near term. The estimated 48-month timeline presented in the INC PCS N00 report is also valid for LEC-only 500 number portability implementation. This timeline is contingent upon other mandated industry activities (e.g., implementation of local number portability).

**7.2 900 IMPLEMENTATION** - The implementation considerations listed in Section 6.1 also apply to LEC-only 900 number portability. There are additional complexities associated with LEC-only 900 number portability. Specifically, these include the contents of the data base and its query responses (see INC 95-0512-010, INC Report on PCS N00 Portability at Attachment 1; and ICCF 96-0913-015, Technical Interconnection Arrangements for 500-Like Non-Geographic Services at Attachment 4).

**7.3 ADDITIONAL IMPLEMENTATION CONCERNS** - The following sections detail additional implementation considerations related to administrative guidelines development, transition plan development and end user education.

**7.3.1. Administrative Guidelines Development** - The INC 900 NXX Code Assignment Guidelines (INC97-0404-012) at Attachment 2 and the INC Personal Communications Services N00 NXX Code Assignment Guidelines (INC 95-0407-009)

at Attachment 3 describe the procedures for 500 NXX and 900 NXX assignment in a non-pooled environment respectively, and will be used as the basis for number assignment guideline development. If LEC-only 500/900 number portability is mandated, the development of new assignment guidelines would also be required. It is estimated that completion of these industry guidelines would require approximately 9 to 12 months following some regulatory directive.

**7.3.2. Transition Plan Development -** Given that 500/900 numbers are in use today, development of a transition plan would also be required.

**7.3.3. End User Education -** Based on the significant end user impacts and customer confusion factors, the INC and the NIIF submits that an end user education program will need to be developed and implemented.

**8.0 CONCLUSIONS -** Using **existing** network and administrative data base capabilities, it is not technically feasible to implement LEC-only 500/900 number portability. However, the technology is available to develop the appropriate network and administrative elements to deploy LEC-only 500/900 number portability. The INC and the NIIF submit that, while it may be possible to implement LEC-only 500/900 portability based on the architectures and call flows noted in this document, INC and NIIF conclude that LEC-only 500/900 number portability is not prudent for the following reasons:

- It does not foster competition in that it decreases and discourages providers and consumers from using the service.
- It creates an "unlevel playing field" by providing a more flexible service offering to one industry segment.
- It will not be user friendly and will be confusing to the public because some 500/900 numbers will be portable and some will not.
- It does not promote efficient number resource utilization because it segregates the resource(s).
- It would be complex, time consuming and expensive to implement.

Consequently, it is the unanimous opinion of the INC and the NIIF that number portability for only-LEC 500 and 900 assigned numbers should not be implemented because it is not prudent, nor is it technically feasible using existing network and administrative data base capabilities.

# ATTACHMENT 1

# ICCF

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# INC REPORT ON PCS N00 PORTABILITY

# INC
# Report on
# PCS N00 Portability

Section

# INC Report on PCS N00 Portability

## EXECUTIVE SUMMARY

The purpose of this INC report is to document the steps required for a potential implementation plan and guidelines for enabling the portability of the PCS N00 numbers among service providers.

A PCS portability architecture has been identified in Section 8. The portability architecture is based on the portability principles and criteria described in Sections 5 and 6. INC recommends this architecture along with a migration plan to provision a nationwide data base with sufficient capabilities to support multiple access arrangements and multiple PCS NPAs. The proposed architecture and associated call flows/routing in Section 8 would support both number portability and meet service provider requirements in a competitive PCS environment. This report includes recommendations for further work on this subject. It is understood that this report includes the most current information available at the time of publication. This report serves as a foundation for detailed implementation work.

The INC has concluded that if PCS number portability is to become a reality the following actions need to be taken by the appropriate regulatory bodies and by the industry.

A clear directive should be issued by the appropriate regulatory bodies to direct the industry to proceed with efforts for detailed implementation to achieve PCS number portability. The directive needs to include answers to the following questions:

- Who will be the owner/operator of the nationwide SMS/local SMS data base administration and how will they be selected?
- How will the costs for PCS portability be recovered?
- Taking into account that the industry needs resolutions of the above questions, when must the industry begin deployment of PCS portability?

When regulatory direction is provided to proceed with PCS portability, INC recommends that an industry group be identified to do the detailed planning for the development and implementation of the nationwide PCS data base. This industry group will address the items identified in Section 10.

# INC Report on PCS N00 Portability

## 1.0 Purpose and Scope

The implementation of personal communications service (PCS) N00 * number portability will impact many facets of the telecommunications infrastructure in World Zone 1 (WZ1). Different architectures and implementation strategies will result in varying levels of impact on the network and its operations.

The purpose of this INC report is to document the steps required for a potential implementation plan and guidelines for enabling the portability of the PCS N00 numbers among service providers.

Included in this work is the development of a migration plan to this portable environment from an assumed N00 NXX service provider implementation. This report addresses a high level target PCS N00 portability architecture and describes how to migrate from an NXX implementation. The portability architecture is based on the portability principles and criteria described in Sections 5 and 6. It includes recommendations for further work on this subject. It is understood that this report includes the most current information available at the time of publication. This report serves as a foundation for detailed implementation work.

This report has been developed via the industry forum consensus process by the PCS Portability Workshop of the INC (Industry Numbering Committee), a standing committee of the ICCF (Industry Carriers Capability Forum) which operates under the auspices of the CLC (Carriers Liaison Committee). The Workshop was formed to address the following issue statement associated with INC Issue # 007:

Issue Statement: The assignment of one non-geographic N00 code for PCS can lead to a shortage of numbers if only blocks of NXX codes are to be issued to PCS service providers. In addition, service provider number portability will not be possible under such an assignment procedure. This situation necessitates the development of a plan to share the available numbering space more efficiently and to provide number portability for PCS subscribers.

The PCS Portability Workshop's mission and scope statements are as follows:

> Mission: To develop an implementation plan and guidelines for the establishment of the portability of the PCS N00 numbering resource for subscribers and service providers.

* A convention used throughout this document is "PCS N00" to refer to all PCS non-geographic NPAs regardless of format.

Scope: This work also requires the development of a migration plan to this portable numbering environment from the N00 NXX service provider environment. An analysis of the architecture alternatives will include but not be limited to technical feasibilities, target technologies, end-user and service impacts (both positive and negative), timing complexities/benefits/costs for each. The architecture alternatives addressed will accommodate the needs of service providers offering technical and user mobility services. The output will consist of documentation of the above.

## 2.0 Definitions

The following terms are defined at the beginning of this report for the benefit of the reader since these terms will be used throughout the document.

**Access Time** - the period commencing when the caller completes dialing a PCS N00 call and ending when the call is delivered by the originating Access Provider to the PCS N00 Service Provider or to a Transport Provider for the PCS N00 Service Provider. (Note that Access Time is only one component of call set-up time.)

**AIN (Advanced Intelligent Network)** - a service-independent architecture which allows its service provider to create and/or modify telecommunications services.

**ANI (Automatic Number Identifications)** - the automatic identification of the calling station or billing number.

**ANI (Automatic Number Identification) II Codes** - ANI II digits are two digits that are sent with the originating telephone number identifying the type of originating station (for example: Plain Old Telephone Service (POTS)[00], Hotel/Motel [06], etc.). Use of the ANI II codes in an SS7 message is referred to as the Originating Line Information Parameter (OLIP). Authorized Representative of Code Applicant/Holder - the person from the applicant's/holder's organization or its agent that has the legal authority to take action on behalf of the applicant/holder.

**CIC (Carrier Identification Code)** - is a numeric code which is currently used to identify an entity which purchased Feature Group B and/or Feature Group D access services. This code is primarily used for routing from the local exchange network to the access purchaser and for billing between the Local Exchange Carrier and access purchaser. CICs are assigned by the North American Numbering Plan Administrator.

**CIP (Carrier Identification Parameter)** - is an SS7 ISUP (ISDN User Part) parameter carried in an Initial Address Message and provides the presubscribed CIC or is the I0XXX/I0IXXXX dialed by the calling party.

**HLR- (Home Location Register)** see SCP/HLR

**ICCF (Industry Carriers Capability Forum)** - provides an open forum under the auspices of the Carrier Liaison Committee to encourage telecommunication entities to discuss and resolve, on a voluntary basis, national technical issues associated with telecommunications network interconnection, and the issues associated with the assignment and use of NANP/World Zone 1 numbering resources.

**IN (Intelligent Network)** - a telecommunications network architecture in which processing capabilities for call control and related functions are distributed among specialized network nodes rather than concentrated in a switching system.

**NANP (North American Numbering Plan)** - is a numbering architecture in which every station in World Zone 1 is identified by a e unique ten-digit address consisting of a three digit NPA code, a three digit central office code of the form NNX/NXX, and a four-digit number of the form XXXX where N represents the digits 2-9 and X represents any digit 0-9.

**NPA (Numbering Plan Area)** - also called area code. An NPA is the 3-digit code which occupies the A, B, and C positions in the 10-digit NANP format which applies throughout World Zone 1. NPAs are of the form NXX, where N represents the digits 2-9 and X represents any digit 0-9. In the NANP, NPAs are classified as other geographic or non-geographic.

a) Geographic NPAs are NPAs which correspond to discrete geographic areas within World Zone 1.
b) Non-Geographic NPAs are NPAs which do not correspond to discrete geographic areas, but which are instead assigned for services with attributes, functionalities, or requirements that transcend specific geographic boundaries within WZ1. The common examples are NPAs in the N00 format; e.g., 800. N00 codes are commonly referred to as Service Access Codes (SACs).

**Number Portability** - number portability in the context of personal communications service implies that a PCS subscriber can change service providers while retaining their number assignment.

**PIC (Presubscribed Inter LATA Carrier)** - the carrier selected by the customer if they wish to be presubscribed to an IC (Interexchange Carrier) rather than selecting the IC on every interLATA call. The PIC is also frequently referred to as the presubscribed IC. In the context of this document PIC is also used as the Presubscribed IntraLATA Carrier.

**PCS (Personal Communications Service)** - for the purpose of this document personal communications service is a set of capabilities that allows some combination of personal mobility, terminal mobility, and service profile management. It enables each personal communications service user to participate in a user defined set of subscribed services, and to initiate and/or receive calls on the basis of some combination of a

personal number, terminal number, and a service profile across multiple networks at any terminal, fixed or mobile, irrespective of geographic location. Service is limited only by terminal and network capabilities and restrictions imposed by the personal communications service provider.

**PCSNDB (Personal Communications Service Numbering Database)** - a regional/local data base which contains PCS number assignments and routing information.

**PCS Record Administrator** - the responsible organization that assumes the duty of managing and administering the appropriate records in the PCS N00/SMS. These duties include data entry, record change, trouble acceptance, referral and/or clearance.

**Personal Communications Service Subscriber** - a person who, or entity which, obtains a personal communications service from a personal communications service provider on behalf of one or more personal communications service users.

**Personal Communications Service User** - a person who, or entity which, has access to personal communications services and has been assigned a personal number.

**Personal Mobility** - the ability of a user to access telecommunication services at any terminal on the basis of a personal identifier, and the capability of the network to provide those services according to the user's service profile. Personal mobility involves the network capability to locate the terminal associated with the user for the purpose of addressing, routing, and charging of the user's calls.

**Personal Number** - a number that uniquely identifies a PCS user and is used to place, or forward, a call to that user.

**PC (Preferred Carrier)** - the carrier (which may be selected by the customer to provision intraLATA or interLATA services).

**PSTN (Public Switched Telephone Network)** - the switched network that enables full and mutual access between public users via E.164 numbers. It is an integrated system of transmission and facilities, signaling processors, and associated operational support systems that are shared by customers.

**SCP (Service Control Point)** - a network data base containing information and/or logic used in call processing to provide services. A service switching point (SSP) contacts an SCP when the SSP recognizes the need for special call handling. Use of this term does not imply any specific technology platform.

**SCP/HLR (Service Control Point/Home Location Register)** for purposes of this document, an SCP/HLR is a data base that the PCSNDB may query in order to translate a dialed PCS N00 number into a geographic number.